

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau(43) International Publication Date
30 October 2003 (30.10.2003)

PCT

(10) International Publication Number
WO 03/089634 A1(51) International Patent Classification⁷: C12N 9/02, (74) Agent: MUELLER, Ingrid; 124 Grenzacherstrasse, C12P 7/40, 7/60, 17/04 CH-4070 Basel (CH).

(21) International Application Number: PCT/EP03/03862

(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW.

(22) International Filing Date: 14 April 2003 (14.04.2003)

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

(25) Filing Language: English

Published:

(26) Publication Language: English

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(30) Priority Data:

02008919.9 22 April 2002 (22.04.2002) EP
02012584.5 6 June 2002 (06.06.2002) EP

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(71) Applicant (for all designated States except US): ROCHE VITAMINS AG [CH/CH]; 124 Grenzacherstrasse, CH-4070 Basel (CH).

(72) Inventors; and

(75) Inventors/Applicants (for US only): HOSHINO, Tatsuo [JP/JP]; 2-18-14, Fueta, Kamakura-shi, Kanagawa-ken 248-0027 (JP). MIYAZAKI, Taro [JP/JP]; Kameino 2-14-8, Fujisawa-shi, Kanagawa-ken 252-0813 (JP). SUGIWARA, Teruhide [JP/CH]; Inzlingerstrasse 80, CH-4125 Riehen (CH).

WO 03/089634 A1

(54) Title: ALDEHYDE DEHYDROGENASE II

(57) Abstract: The present invention concerns a novel aldehyde dehydrogenase having the following physico-chemical properties: a molecular weight of $100,000 \pm 10,000$ Da which comprises two homologous subunits or a molecular weight of $150,000 \pm 15,000$ Da which comprises three homologous subunits, each subunit having a molecular weight of $55,000 \pm 2,000$ Da; dehydrogenase activity on L-sorbose, D-Glucosone, D-glucose and D-xylose; utilizes as cofactor pyrroloquinoline quinone; has an optimum pH of from 6.5 to 8.0 for the production of vitamin C and an optimum pH of about 9.0 for the production of 2-keto-L-gulonic acid from L-sorbose; and is inhibited by Co^{2+} , Cu^{2+} , Fe^{3+} , Ni^{2+} , Zn^{2+} , and monoiodoacetate, is derived from a microorganism belonging to the genus *Gluconobacter*.